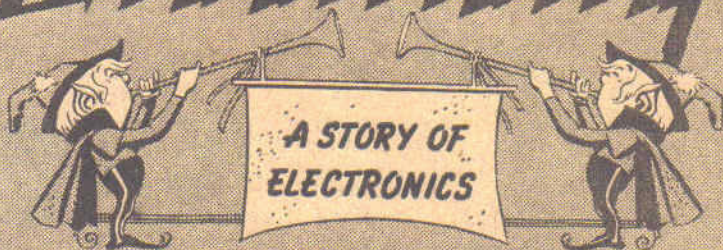


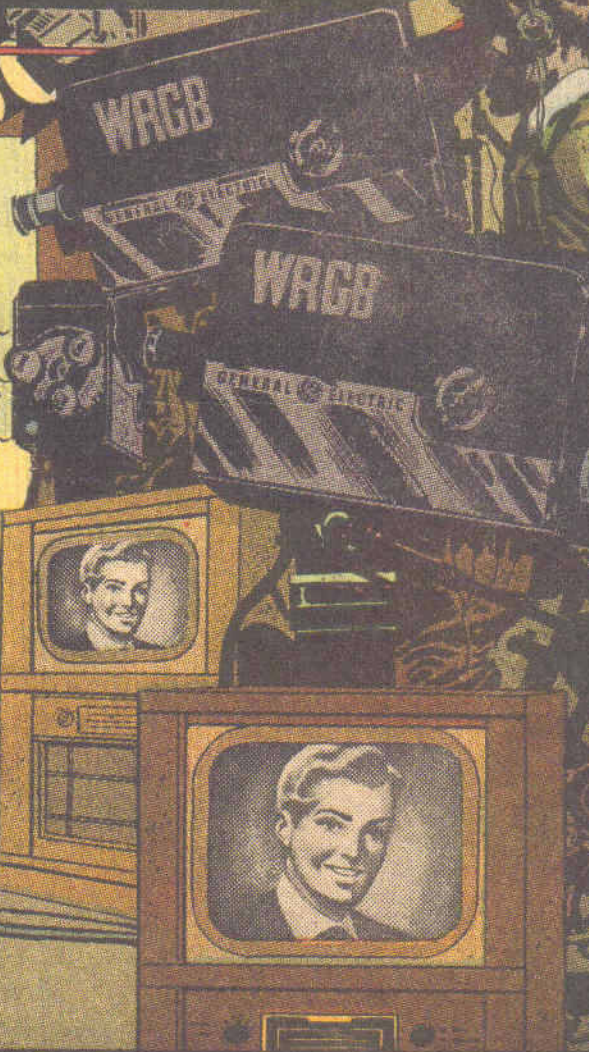
NUMBER  
SEVEN

# ADVENTURES IN *Electricity*



ADVENTURE  
SERIES

Prepared for  
**GENERAL ELECTRIC**  
By GENERAL COMICS, Inc.

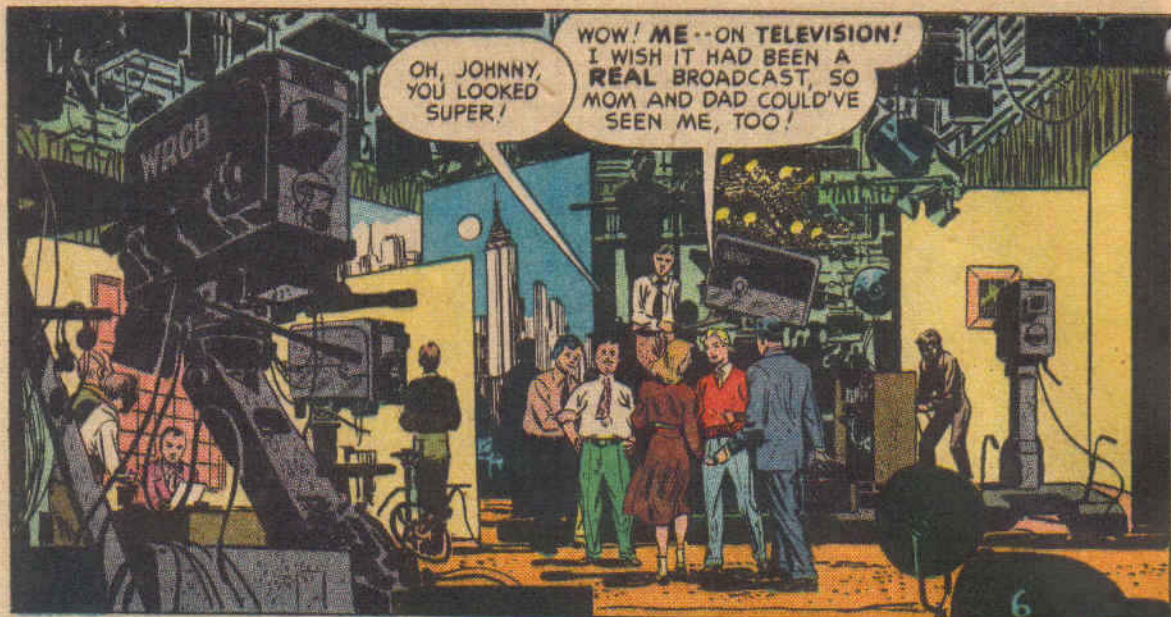






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YOU SEE, THE WHOLE SHOW--ACTORS, SETS, LIGHTS, CAMERAS, SOUND--**EVERYTHING** IS UNDER THE DIRECTION OF THE PRODUCER UP THERE IN THE CONTROL ROOM. LET'S GO UP...

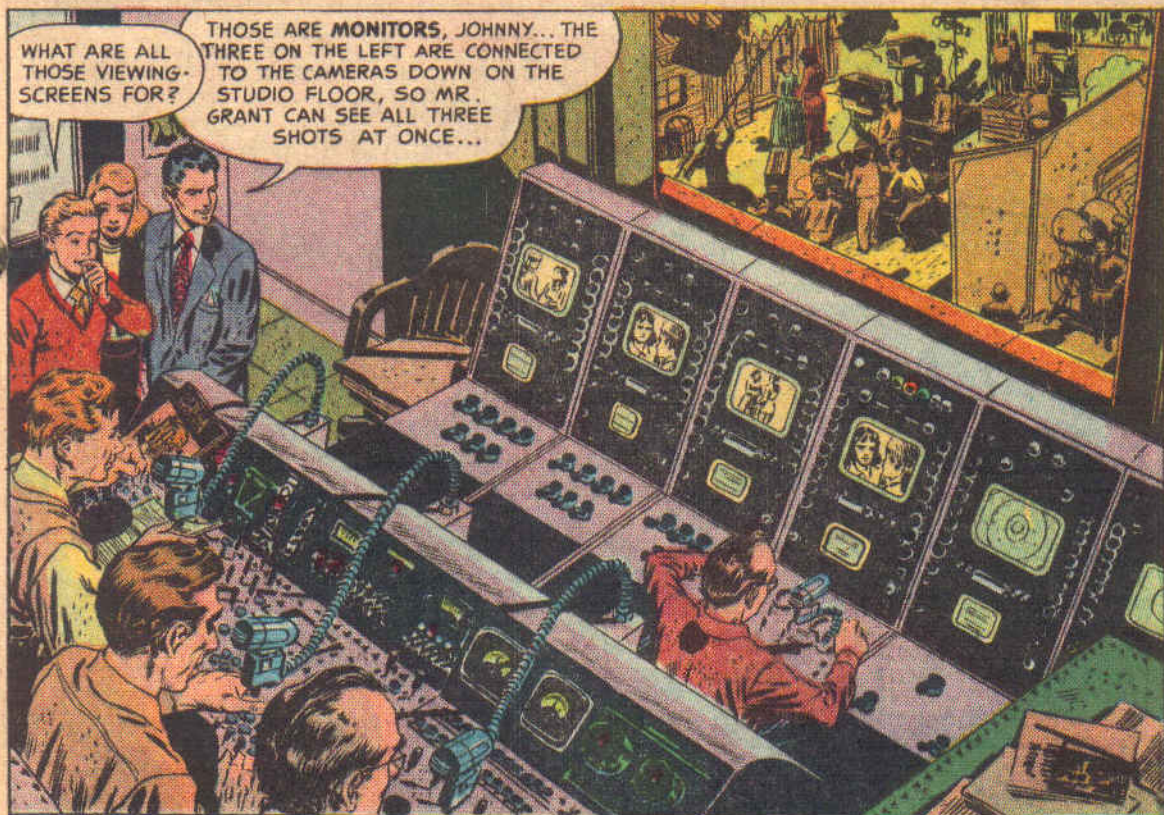


SOON, INSIDE THE CONTROL ROOM...

BUT, ED, THE SIGN SAID "NO VISITORS..."

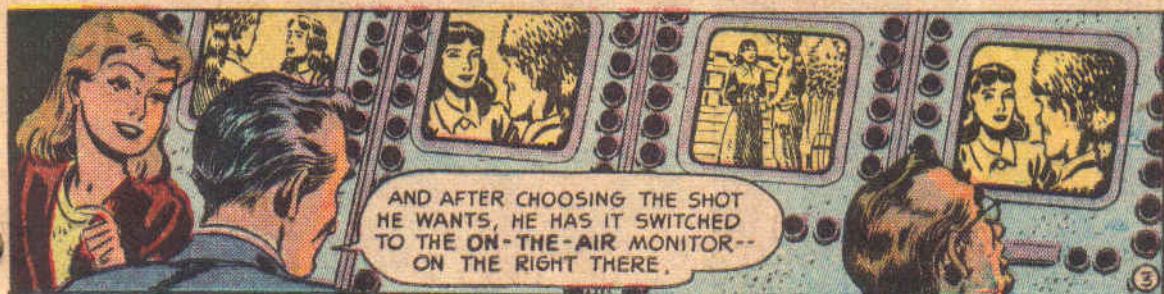
YOU CAN THANK MR. GRANT, THE PRODUCER HERE, FOR BREAKING THE RULES FOR YOU TWO!

HELLO, JANE-- JOHNNY-- YOU'RE JUST IN TIME... WE'RE ABOUT TO GO ON THE AIR!



WHAT ARE ALL THOSE VIEWING-SCREENS FOR?

THOSE ARE MONITORS, JOHNNY... THE THREE ON THE LEFT ARE CONNECTED TO THE CAMERAS DOWN ON THE STUDIO FLOOR, SO MR. GRANT CAN SEE ALL THREE SHOTS AT ONCE...



AND AFTER CHOOSING THE SHOT HE WANTS, HE HAS IT SWITCHED TO THE ON-THE-AIR MONITOR-- ON THE RIGHT THERE.



AFTER THE BROADCAST...

WELL, THANKS FOR LETTING US LOOK AROUND, MR. GRANT... I'VE A LOT TO THINK ABOUT NEXT TIME I WATCH OUR SET AT HOME!



WRGB

SAY, ED, WHAT'S THAT FUNNY-LOOKING TRUCK?

THAT'S A TELEVISION MOBILE UNIT--



"IT PICKS UP ON-THE-SPOT EVENTS..."

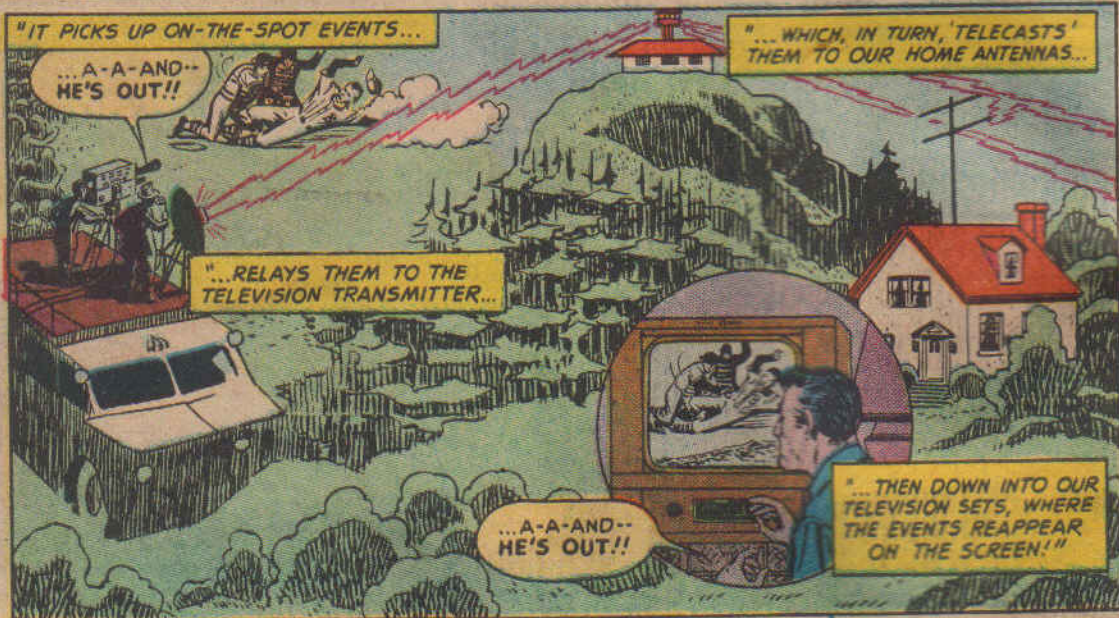
...A-A-AND-- HE'S OUT!!

"...WHICH, IN TURN, 'TELECASTS' THEM TO OUR HOME ANTENNAS..."

"...RELAYS THEM TO THE TELEVISION TRANSMITTER..."

...A-A-AND-- HE'S OUT!!

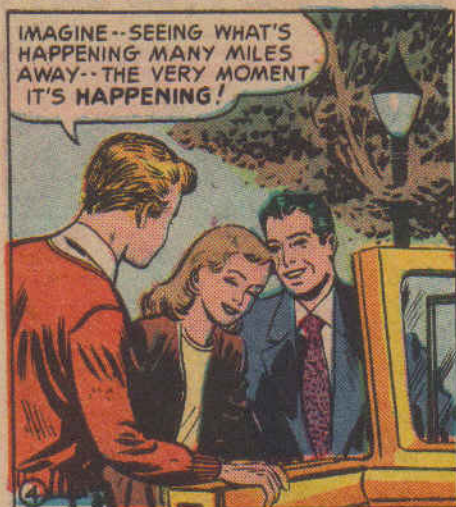
"...THEN DOWN INTO OUR TELEVISION SETS, WHERE THE EVENTS REAPPEAR ON THE SCREEN!"



IMAGINE--SEEING WHAT'S HAPPENING MANY MILES AWAY--THE VERY MOMENT IT'S HAPPENING!

JEEPERS--SENDING A PICTURE THROUGH SPACE! IT'S ALMOST LIKE A MIRACLE!

THAT'S THE MIRACLE OF TELEVISION, JOHNNY --







-- A PICTURE PICKED UP BY AN ELECTRONIC TUBE... BROADCAST LIKE ANY RADIO SIGNAL... AND MADE VISIBLE IN OUR HOME SETS BY ANOTHER ELECTRONIC TUBE!

'ELECTRONIC TUBE'? DOES THAT HAVE ANYTHING TO DO WITH ELECTRONS?




YES--ELECTRONICS IS A WONDERFUL BRANCH OF ELECTRICAL SCIENCE-- THE USE AND CONTROL OF FREE ELECTRONS... ELECTRIC CURRENT IN SPACE!




GOLLY, THAT MIGHT MAKE SENSE TO YOU, JOHNNY-- BUT I'VE NEVER EVEN SEEN AN ELECTRON...

NOBODY HAS, JANE-- THEY'RE INVISIBLE... WHY, THEY'RE SO TINY THAT-- ER-- AH-- AREN'T THEY, ED?



TINY IS RIGHT! IN FACT--25 TRILLION ELECTRONS, LINED UP, WOULD EQUAL ONLY ONE INCH!

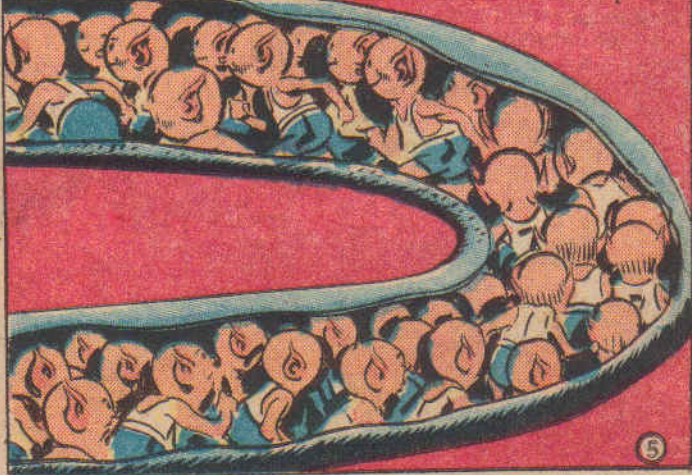
WE MAY BE TINY, BUT WE CAN DO MIGHTY BIG THINGS!



AND WHAT HAVE THEY TO DO WITH ELECTRIC CURRENT?

WELL, JANE, TO PUT IT SIMPLY--

"AN ELECTRIC CURRENT IS A STREAM OF MILLIONS OF THESE ELECTRONS PUSHED THROUGH A WIRE-- IN A CONTINUOUS PATH, OR CIRCUIT..."





ELECTRICITY FLOWING  
THROUGH WIRES--

"...POWERS OUR MACHINERY..."

"...OPERATES THE ELECTRICAL  
'SERVANTS' IN OUR HOMES..."

"...GIVES US HEAT AND LIGHT..."

"...AND MAKES LIFE EASIER, MORE  
COMFORTABLE FOR ALL OF US."

AND ELECTRIC WAVES  
FLOWING THROUGH SPACE  
HAVE MADE POSSIBLE  
MANY MORE ELECTRICAL  
WONDERS--INCLUDING  
TELEVISION!

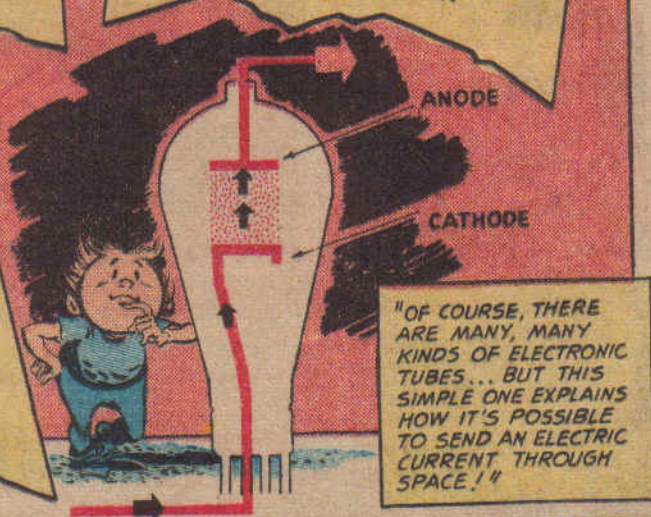
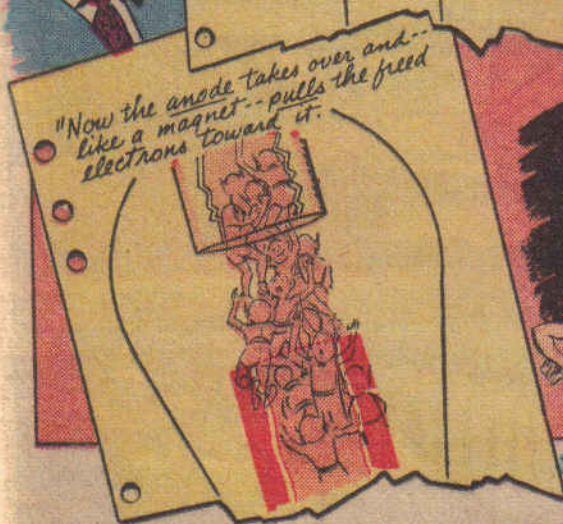
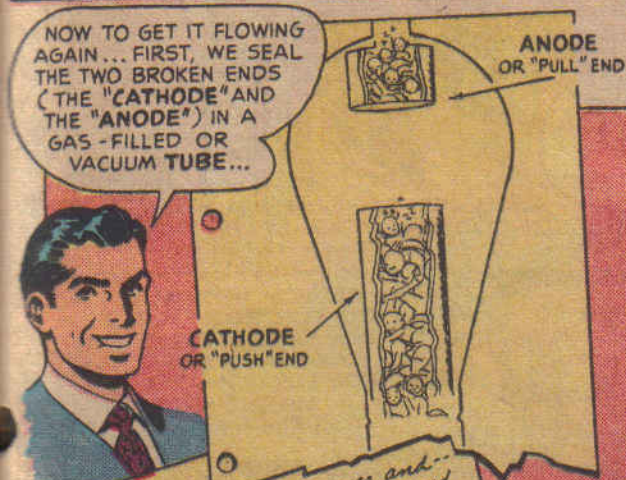
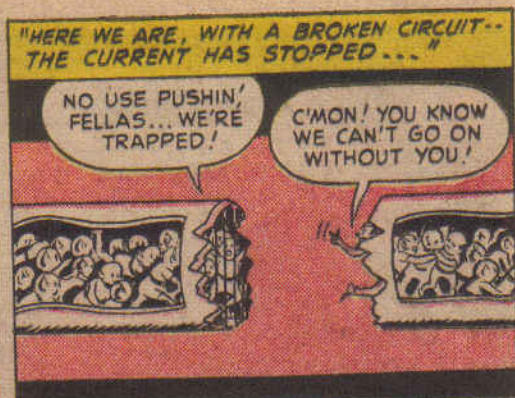
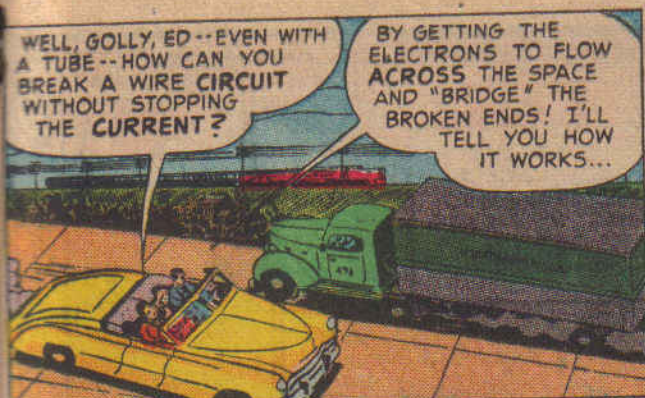
BUT, ED, HOW DO  
YOU GET THESE WAVES  
THROUGH SPACE?

THEY'RE SENT FROM THE TRANS-  
MITTER WITH ELECTRONIC TUBES,  
INSIDE WHICH THERE ARE ELECTRONS...  
AND WE CAN OPEN THE CIRCUIT-- AND  
FREE THESE ELECTRONS FOR AN  
INSTANT--WITHOUT STOPPING  
THE CURRENT!

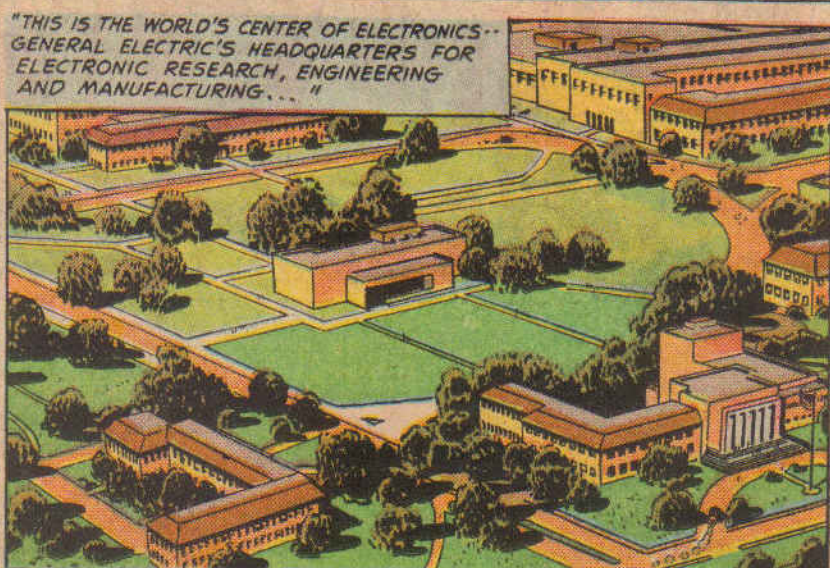
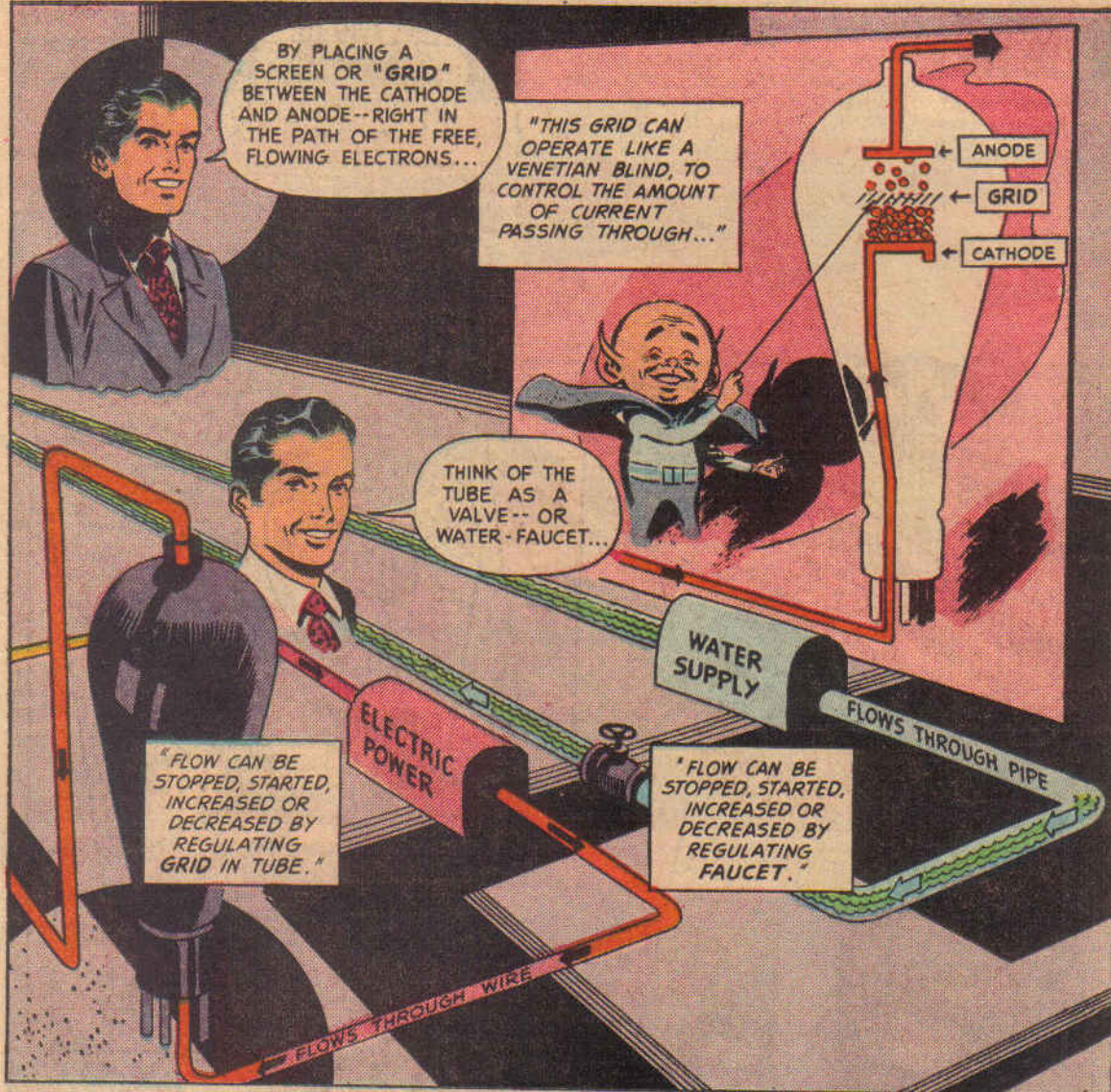
THERE'S THE KNOLLS--THE  
GENERAL ELECTRIC RESEARCH  
LABORATORY, WHERE SOME  
OF THE WORLD'S GREATEST  
SCIENTISTS ARE AT WORK...

IN FACT, IT WAS G.E.'S  
DR. IRVING LANGMUIR WHO  
HELPED DEVELOP THE HIGH-  
VACUUM TUBE THAT MADE  
MODERN ELECTRONICS POSSIBLE!





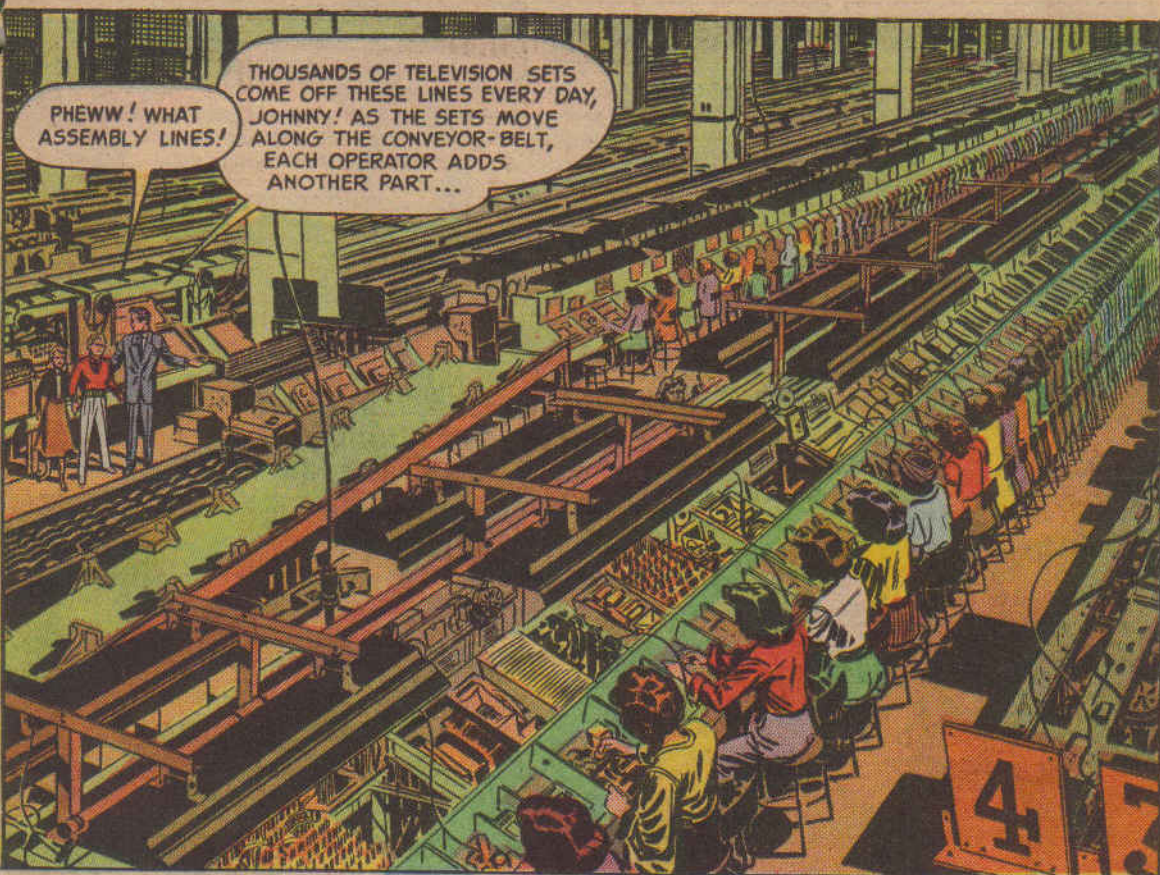






PHEWW! WHAT  
ASSEMBLY LINES!

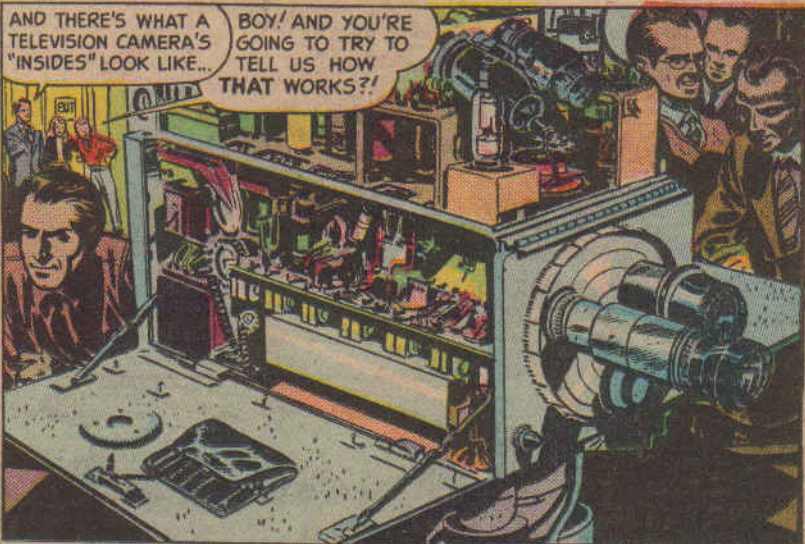
THOUSANDS OF TELEVISION SETS  
COME OFF THESE LINES EVERY DAY,  
JOHNNY! AS THE SETS MOVE  
ALONG THE CONVEYOR-BELT,  
EACH OPERATOR ADDS  
ANOTHER PART...



"AND ALL THE SETS ARE CAREFULLY  
INSPECTED BEFORE SHIPMENT..."

AND THERE'S WHAT A  
TELEVISION CAMERA'S  
"INSIDES" LOOK LIKE...

BOY! AND YOU'RE  
GOING TO TRY TO  
TELL US HOW  
THAT WORKS?!



WELL, I'LL  
TRY TO GIVE  
YOU A SIMPLE  
IDEA, ANYWAY!  
LET'S GO BACK  
TO OUR CATHODE  
FOR A MINUTE...  
YOU SEE ...

"...just as the cathode  
gives off free electrons  
when heated..."



"...certain metals also  
release electrons--when  
exposed to light!"

LIGHT BEAMS

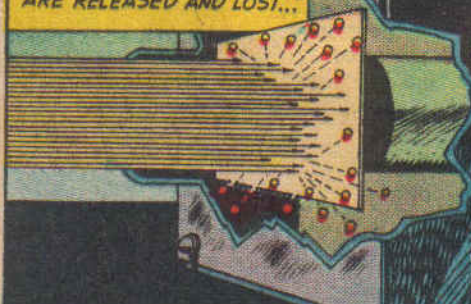




NOW, IN A TELEVISION CAMERA, INSTEAD OF FILM, THERE IS SUCH A LIGHT-SENSITIVE PLATE-- SEALED IN AN ELECTRONIC TUBE...



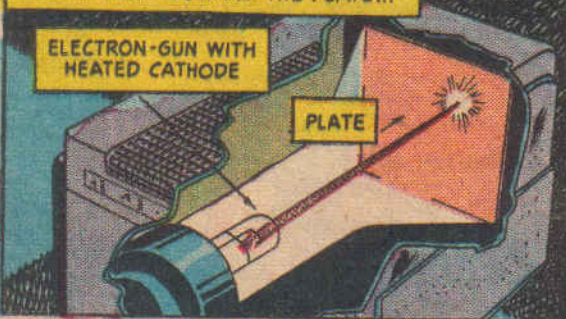
"WHEN LITTLE BEAMS OF LIGHT HIT THE FRONT OF THIS PLATE, ELECTRONS ON THE LIGHTED SURFACES ARE RELEASED AND LOST..."



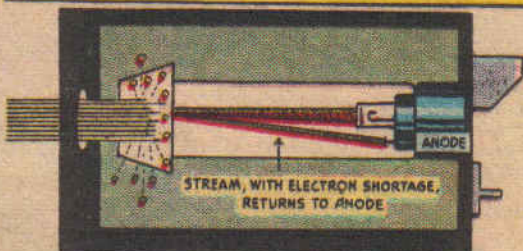
THE MORE LIGHT, THE MORE ELECTRONS LOST!



"BEHIND THIS PLATE IN THE TUBE, THE HEATED CATHODE OF AN ELECTRON-GUN BOILS OFF A STREAM OF ELECTRONS... AND SHOOTS THEM OUT IN A CONCENTRATED BEAM TOWARD THE PLATE..."



"THE PLATE INSTANTLY ABSORBS FROM THE STREAM ITS EXACT NUMBER OF MISSING ELECTRONS..."



"THE REMAINDER OF THE STREAM, WHICH NOW HAS A SHORTAGE OF ELECTRONS, FLOWS TO THE ANODE... TO COMPLETE THE CIRCUIT."

THAT MEANS THAT THE AMOUNT OF LIGHT ON THE PLATE AFFECTS THE AMOUNT OF THIS SHORTAGE IN THE ELECTRON STREAM...

THAT'S RIGHT... IN OTHER WORDS, WE'VE MEASURED LIGHT WITH ELECTRIC CURRENT!



AND, OF COURSE, EACH LITTLE LIGHT CHANGE ON THE PLATE CAUSES AN EQUAL CHANGE IN THE ELECTRIC CURRENT.



AND HOW DOES THIS PLATE TAKE THE PLACE OF FILM?

WELL, JOHNNY, SUPPOSE FOR A MINUTE THAT WE SAW A PICTURE OF YOUR FACE PRINTED IN A MAGAZINE...

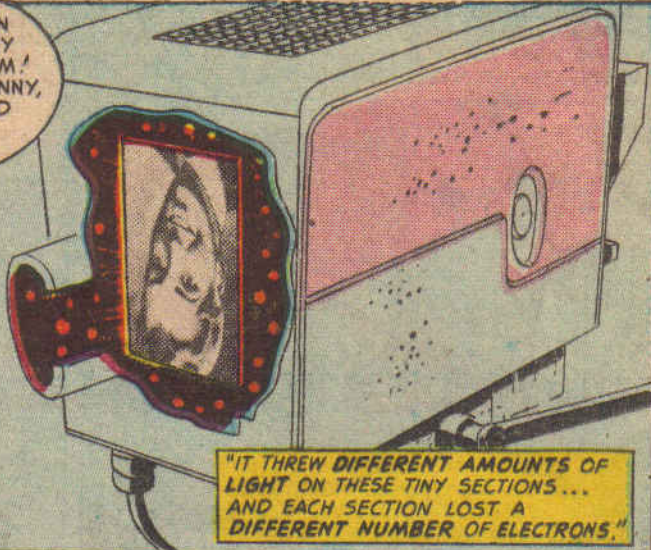


"...A CLOSE LOOK AT IT WOULD SHOW IT TO BE MADE UP OF MANY TINY LIGHT AND DARK AREAS..."



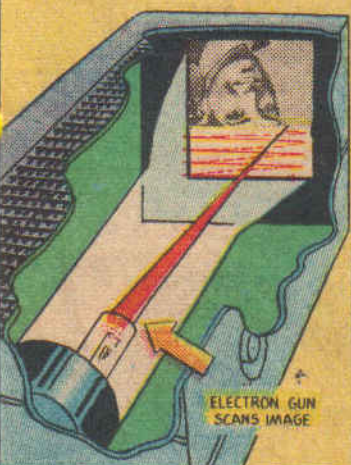


NOW, THE PLATE IN THE TELEVISION CAMERA IS ALSO MADE UP OF MANY TINY SECTIONS... 360,000 OF THEM! SO THAT IN THE STUDIO TODAY, JOHNNY, WHEN THE CAMERA-LENS FOCUSED YOUR PICTURE-IMAGE ON THAT LIGHT-SENSITIVE PLATE...



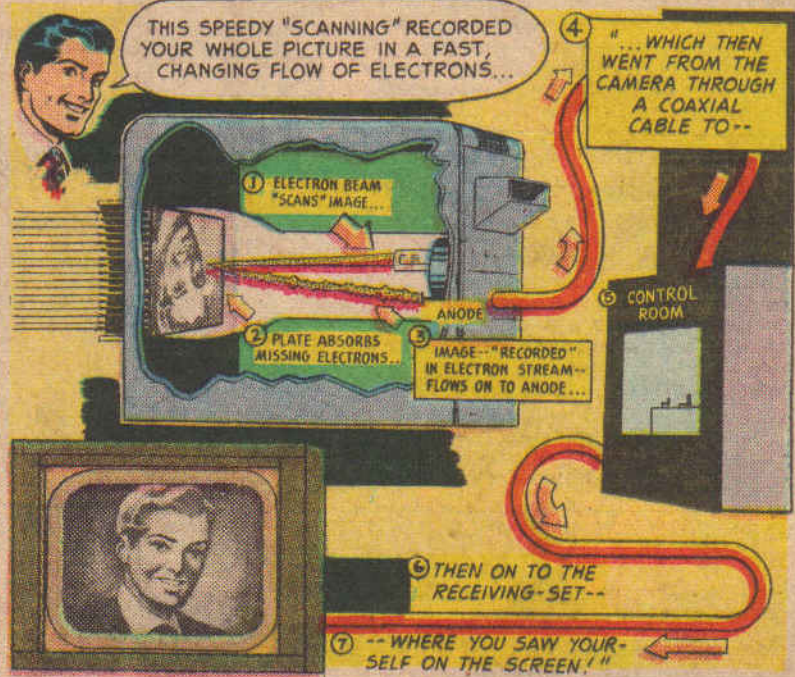
"IT THREW DIFFERENT AMOUNTS OF LIGHT ON THESE TINY SECTIONS... AND EACH SECTION LOST A DIFFERENT NUMBER OF ELECTRONS."

"NOW BEHIND THE PLATE, THE ELECTRON-GUN THEN DIRECTED A STREAM OF ELECTRONS BACK AND FORTH ACROSS YOUR IMAGE..."



"...COVERING ALL OF THOSE 360,000 SECTIONS IN 1/30TH OF A SECOND!"

THIS SPEEDY "SCANNING" RECORDED YOUR WHOLE PICTURE IN A FAST, CHANGING FLOW OF ELECTRONS...



WAIT A MINUTE, ED-- IF JOHNNY'S PICTURE WAS CHANGED INTO A FLOW OF ELECTRONS... AND SINCE YOU CAN'T SEE ELECTRONS, HOW COME WE COULD SEE HIM ON THE SCREEN?

BECAUSE, JANE--

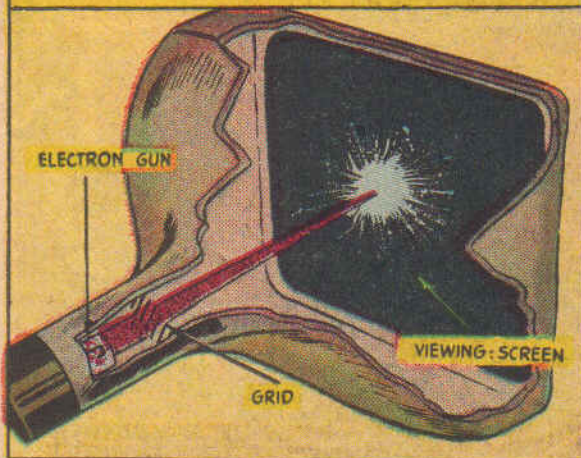


"--just as the plate in the camera tube loses electrons when hit by light..."

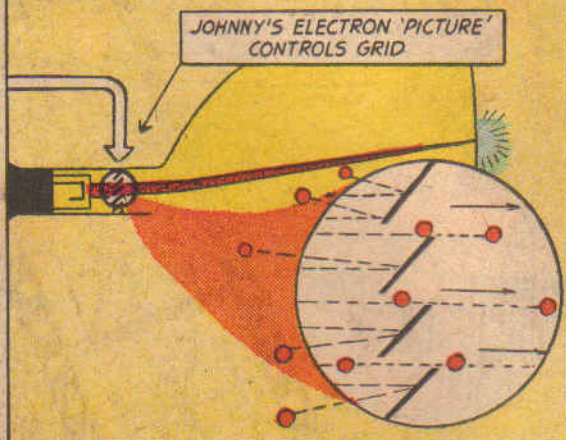




"NOW IN THIS PICTURE-TUBE, AN ELECTRON GUN SHOOTS A STEADY STREAM OF ELECTRONS--THROUGH A GRID--TO THE REAR OF THE VIEWING-SCREEN..."



"THE ELECTRIC SIGNALS MAKING UP JOHNNY'S PICTURE WERE FED INTO THIS GRID, OPERATING IT LIKE A VENETIAN BLIND TO CONTROL THE EXACT NUMBER OF ELECTRONS PASSING THROUGH TO THE SCREEN..."

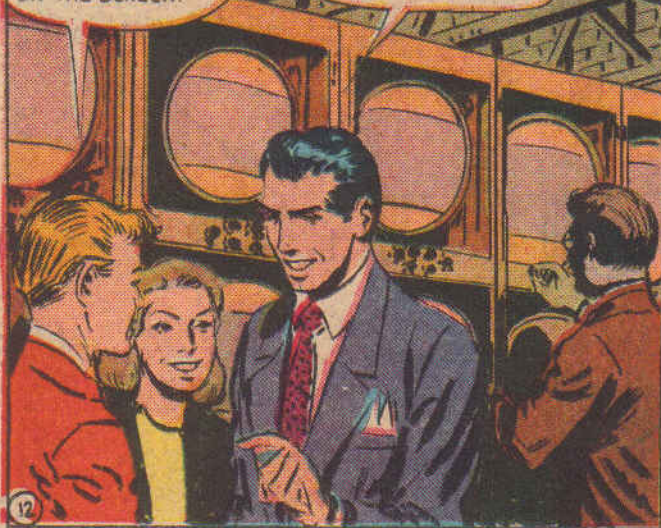


"SO THAT AS THE DIFFERENT AMOUNTS OF ELECTRIC CURRENT HIT THE SCREEN, THEY WERE CHANGED BACK INTO THE EXACT AMOUNTS OF LIGHT WHICH JOHNNY'S IMAGE FIRST THREW ON THE CAMERA-PLATE."



AND YOU SAY IT TOOK ONLY 1/30 OF A SECOND TO RECORD MY WHOLE PICTURE ON THE SCREEN?

YES, IT'S HARD TO IMAGINE SUCH SPEED, ISN'T IT? SO FAST THAT WE ACTUALLY SAW YOUR WHOLE PICTURE AT ONCE!

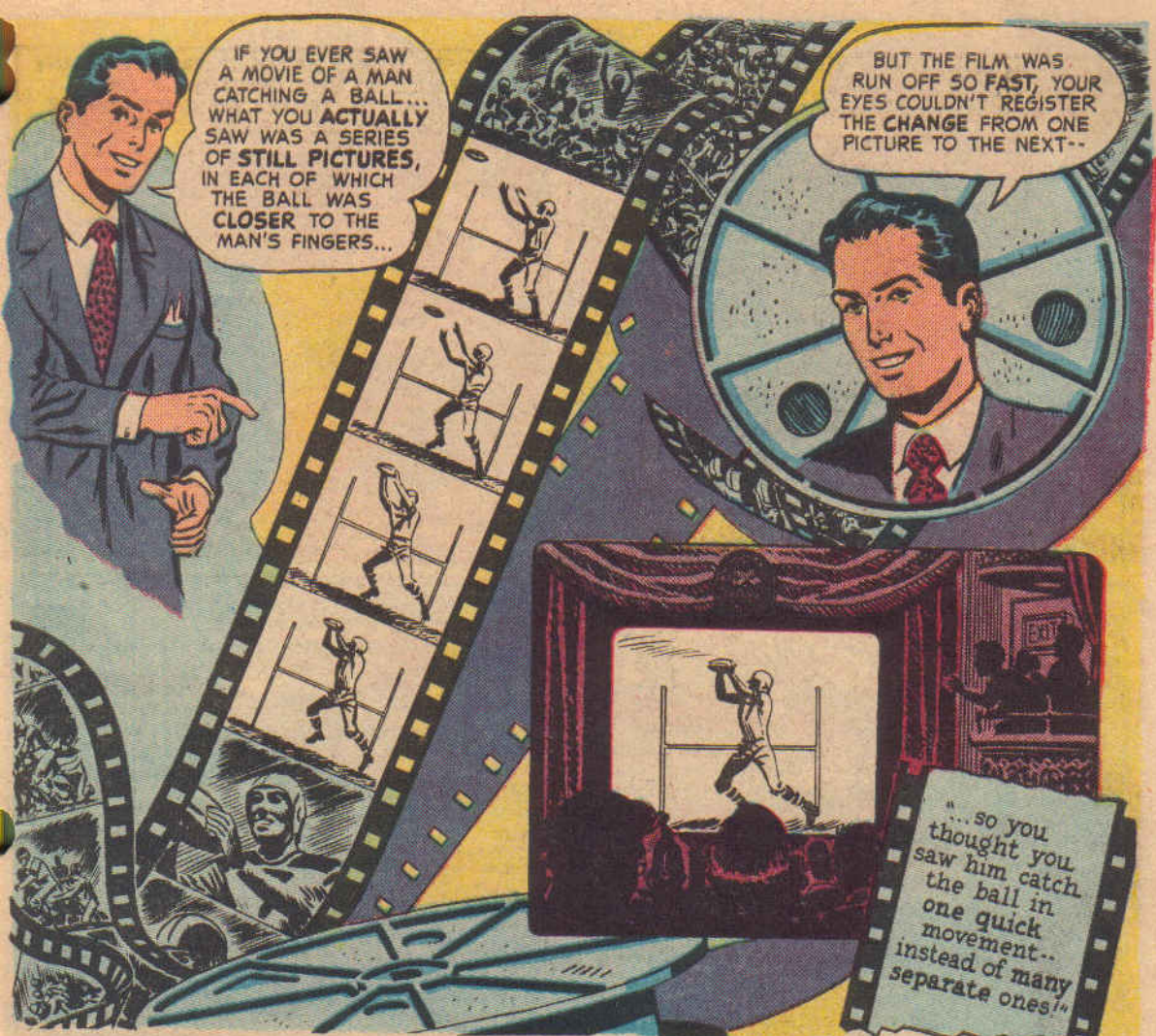


WE EVEN SAW JOHNNY MOVE ON THE SCREEN, ED? HOW DID THAT HAPPEN?

WELL, JANE--YOU KNOW THAT MOVIES, FOR INSTANCE, ARE SIMPLY A SERIES OF "STILL" PICTURES ON FILM, SHOWN SO FAST THEY SEEM TO MOVE...









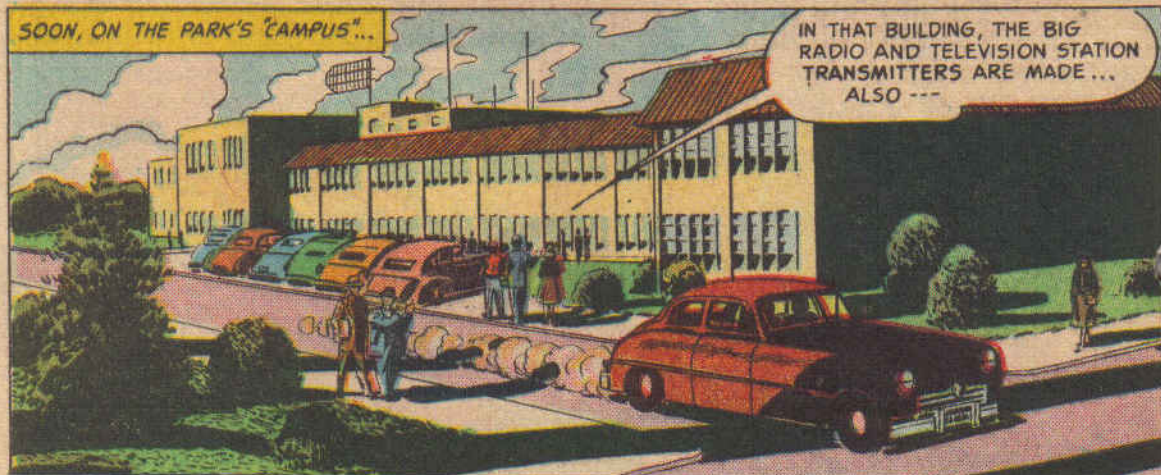
YOU SEE, RADIO AND TELEVISION BOTH DEPEND ON ELECTRONIC TUBES TO GENERATE THE HIGH-FREQUENCY WAVES NECESSARY FOR TRANSMISSION!



THOUSANDS OF RADIO AND PHONOGRAPH COMBINATIONS ARE MANUFACTURED HERE AT ELECTRONICS PARK...

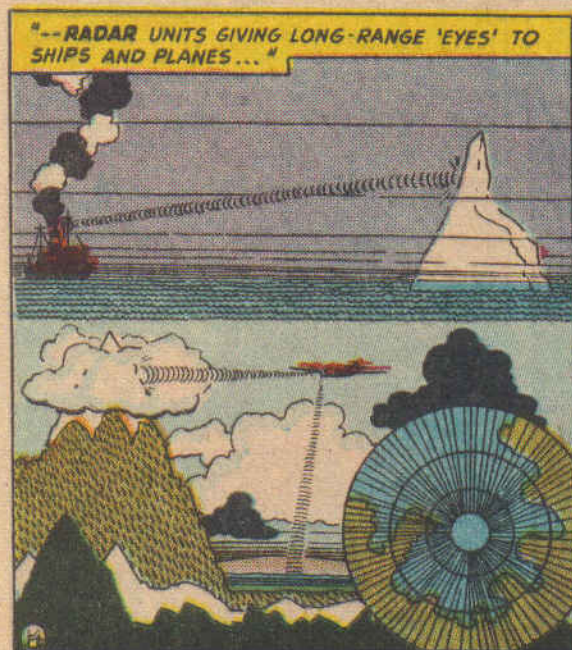


SOON, ON THE PARK'S "CAMPUS"...

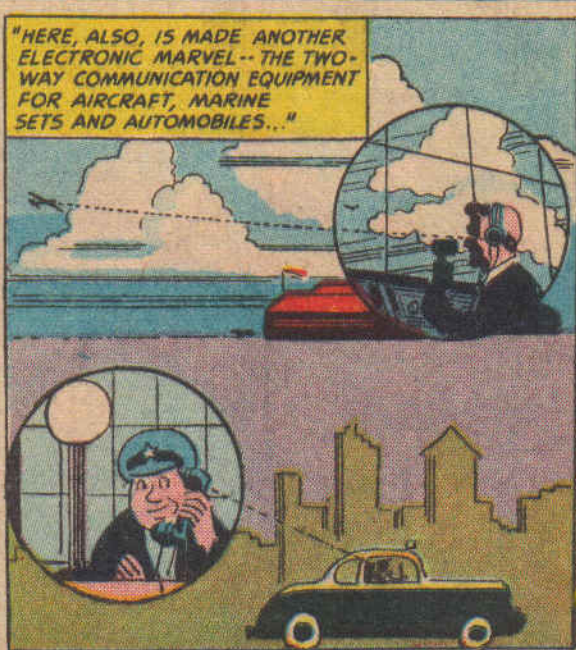


IN THAT BUILDING, THE BIG RADIO AND TELEVISION STATION TRANSMITTERS ARE MADE... ALSO ---

"--RADAR UNITS GIVING LONG-RANGE 'EYES' TO SHIPS AND PLANES..."



"HERE, ALSO, IS MADE ANOTHER ELECTRONIC MARVEL--THE TWO-WAY COMMUNICATION EQUIPMENT FOR AIRCRAFT, MARINE SETS AND AUTOMOBILES..."





... AND THE REMARKABLE  
FACSIMILE EQUIPMENT--THAT  
BROADCASTS AND PRINTS  
NEWSPAPER PICTURES AND  
STORIES BY WIRELESS!

WHAT ABOUT THE  
ELECTRIC EYE, ED--IS  
THAT PART OF  
ELECTRONICS, TOO?

THAT'S RIGHT,  
JOHNNY... A  
LIGHT BEAM IS  
INTERRUPTED  
AND --

GENERAL

"--DOORS OPEN, AS  
IF BY MAGIC!"

CLANG  
CLANG  
CLANG  
CLANG  
CLANG

"BELLS CLANG, TO  
WARN OF DANGER..."

"...ELECTRONIC COUNTERS  
DO OUR COUNTING  
FOR US..."

7,423  
7,424  
7,425...

CLICK  
CLICK

"...DRINKING  
FOUNTAINS  
SPURT FORTH  
WATER!"



AND IN OUR FACTORIES, ELECTRONS  
'IN OVERALLS' ARE SILENTLY AND  
SWIFTLY AT WORK--

"...INSPECTION  
PINHOLE  
OTHER

TWO MILLION COLORS?!  
AND I THOUGHT THERE  
WERE ONLY TEN THOUSAND!

MATCHING COLORS  
FOR  
2,000,000 C

... ANALYZING  
FOR CHEMICAL

... FOLLOWING AND CUTTING COMPLICATED PATTERNS IN METAL."

MATCHING CHART  
FOR  
2,000,000 COLORS

WELL, YOU'RE  
ONLY HUMAN.

IS DIRECT  
CURRENT VERY  
IMPORTANT, ED?

IT'S ABSOLUTELY ESSENTIAL,  
JANE--FOR THE OPERATION OF  
MACHINE TOOLS, LOCOMOTIVES,  
ELEVATORS, MINING EQUIPMENT,  
MAKING ALUMINUM AND STEEL--  
AND DOZENS OF OTHER  
INDUSTRIAL  
USES!

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GEE - ELECTRONICS  
IS REALLY A  
WONDERFUL BRANCH  
OF ELECTRICAL SCIENCE.

YES...WITH ELECTRONICS,  
SCIENCE--INDUSTRY--AND OUR  
OWN HOMES--HAVE BEEN GIVEN  
NEW "EARS," "EYES" AND "HANDS"  
--TO HELP MAKE WORK EASIER...  
AND LIFE MORE ENJOYABLE  
FOR EVERYONE!

GENERAL ELECTRIC  
SCHENECTADY, N. Y.

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